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EDITORIAL ETCHINGS.

The attention of dairymen and farmers generally is called to the article upon "Locating and Building Creameries, Cheese Factories and Farm Dairies," by Mr. Oscar Erf, which commences in this issue of the Agricultural Student. The article is carefully prepared, and is the result of the experience of the writer. Mr. Erf has been one of the instructors in the Ohio Dairy School for the past few years, and has also had good experience in creamery and cheese factory operation, and in the erection and equipment of plants for these industries.

Notwithstanding the agitation of the question by humane societies and by good people generally, the traffic in "bird ornaments" for the millinery trade still continues in full force. A glance about us at any gathering, or upon the streets, will show us clearly that the feathered kingdom is still the prey of fashion's folly. Throwing out the sentimental side of the question for the consideration of others, let us see if there is not something else than the lives of birds concerned in this wholesale slaughter.

The statistician tells us that in 1890 the United States contained 4,564,641 farms, whose acreage was

623,218,619, and which lands were valued at \$13,279,252,649. From the American Farmer Magazine we learn that "the labor of the farmer and fruit grower is repaid by products to the value of \$2,460,107,454, and it is said that insects and rodents destroy annually some \$200,000,000 worth of products; and this, with the protection we now have with the birds. The full value of the protection that birds afford to man is appreciated by but few. Think of the enormous number of insects that are destroyed by them in their daily search for food. Consider, if you will, the incalculable number of weed seeds that are destroyed in a year by a single quail, or turtle dove, or horned lark. Perhaps, though, the greatest direct benefit comes from the much abused hawks and owls, the first intimation of whose presence always brings the cry "Get the gun!" Instead of being enemies, these birds are staunch friends, and but for their aid our fields would ere long be overrun by rodents and small pests of every description.

And why are these feathered friends destroyed? Mainly for two reasons—food and millinery ornaments. Under the former class come the game birds, but these are quite well protected by stringent laws,

and as a rule increase more rapidly than the great majority of birds. Regarding the killing of the second class of birds for millinery ornaments we wish merely to draw attention to the matter, and ask whether the bird is of more value as an inanimate ornament on a woman's hat, or as a living, moving ornament to our parks and forests, where, of necessity to its existence, it must be a friend of the agriculturist. In order that it may live, insects, weed seeds and other nuisances must be devoured and destroyed.

A recent circular issued by the Department of Agriculture at Washington is authority for the statement that the government of Russia is planning to enter upon quite an extensive system of agricultural education.

At present there is in that country an advisory board called the Agricultural Council, of which the minister of agriculture is chairman. At a recent meeting of this body the minister of agriculture presented an outline, which was considered at some length and a general plan of agricultural education was elaborated. In the introduction of the document referred to above the statement is made that in spite of the great importance of agricultural pursuits to Russia, and in spite of the great fertility of the soils, "the crops obtained even on the chernozem (black soil) are only one-third to one-half as large as those harvested from the incomparably inferior soils of western Europe. Almost everywhere in Russia the primitive processes of farming are persistently followed by the farmers, while the number of persons who are fitted by education and training to disseminate information on the rational methods of agriculture is comparatively insignificant."

The Russian system of education is to be based upon somewhat the same principles as that of this country. It is another instance of the spread of western civilization into the enslaved and prejudicial regions of the east.

An interesting experiment in agricultural education is being consummated at Woodbine, New Jersey, it being what is known as the Baron de Hirsch Agricultural and Industrial School. This school is the only one of the kind in the United States. It welcomes to its opportunities not only the Jewish youth who have been in this country for some time, but also the boys who have come to America from any country in advance of their parents, but more preferably natives of Roumania and Russia. At this school these boys may become accustomed to American ways, and thus be able to profit those who are to follow them.

This school is one of the many philanthropic schemes of Baron Maurice de Hirsch de Gereuth, a native of Bavaria. His philanthropy seems to be expended mostly upon the Hebrew races, and undoubtedly there is much room for it to ramify and spread into many beneficial lines. The mission of the institution under discussion seems to be to rear a class of intelligent and progressive Jewish farmers. This in itself will be an interesting experiment, for perhaps no other race of people is more thoroughly permeated with the instinct for a single vocation than is the Jewish people for mercantile pursuits, and it would be a change indeed for them to be turned, in some manner, into other channels of industry and occupation.

The ideas of the trustees of the Baron de Hirsch fund seem to be good. In the school it is the aim to give up a large portion of the time to prac-

tical work, while at the same time the theoretical branches are not to be neglected.

The school is located upon a farm of 240 acres, of which only a part is now under cultivation. Five horses, several cows, 200 fowls and an apiary of several hives are kept upon the farm. A dormitory for 100 students, a blacksmith and wheelwright shop, and storage house are soon to be constructed.

A survey of the course of instruction in the school gives the impression of utility in organization, and it surely is aiming in the right direction to make good farmers and at the same time good citizens. We wish the institution all success.

Agriculture at Cambridge University.

A lengthy report has been issued by the General Board of Studies of Cambridge University with reference to the establishment of a Department of Agriculture.

Sir Walter Gilbey and others have interested themselves in the endowment of this department, and it is thought that \$10,000 a year will be immediately available for stipends and maintenance. "After deducting the professor's stipend of 800 pounds (\$4,000) the balance of the fund would suffice to meet the necessary expenditures for special courses of lectures by teachers already connected with existing departments, for laboratory facilities in existing buildings, for secretarial assistance, etc." Sir Walter Gilbey "specially desires to encourage the study of agricultural science among university students who are destined to have the ownership or control of landed estates, and therefore puts forward the suggestion that this study find academic recognition as a qualification for the ordinary B. A. degree."

This reminds one that "In 1827 Thomas Hollis, a merchant of London, 'though jeered at and sneered at by many' (in England) persisted in his design to endow Harvard College with a 'professorship of mathematics and physical science.' It was not until 1730 that the 'Principia' were firmly established even at Newton's own University of Cambridge, while at Oxford it is said that the 'majority of the residents regarded mathematics and Puritanism as allied and equally unholy subjects.'"

Columbus Horticultural Society.

The society held its regular monthly meeting in Horticultural hall, Ohio State University, on Saturday, March 25, at 2 p. m. The following program was presented:

The Metropolitan Park System of Boston, E. Meade Wilcox, Cambridge, Mass; Sources of the Ohio Flora, A. D. Selby and J. W. T. Duvel, Wooster, O.; Forcing Rhubarb in the Dark, John F. Cunningham, Department of Horticulture, O. S. U. Professor Derby added some very interesting notes to Mr. Wilcox's paper.

University Farm Notes.

Owing to the late spring the farm work is not much advanced. The clover seed is sown and wheat looks very well at this time. The rye for soiling is a little backward, owing to the lateness of sowing last fall.

We are rolling our meadows and wheat when the soil is dry enough and not frozen. Work has not opened on the campus, owing to the frequent freezing. Our pigs are doing well. Have sold 33 fat hogs this month.

The poultry went through the winter in good condition. Mr. Bridge of this city mated our breeding pens. We have two yards of S. C. Brown

Leghorns, one each of B. Plymouth Rocks and Black Langshans. Owing to the poor results in the past, we are not going to use artificial incubation, but trust to the old hen; however, we will use the artificial brooders. The poultry yards are in as promising condition at present as they ever were. FRANK RUHLEN.

University Garden Notes—March.

During the winter season the glass houses have been devoted mostly to the growing of lettuce and radishes. These crops are quite profitable to the greenhouse man when a good market is to be had, and where good management is used.

Some work in bulb forcing has been done, the bulbs used being narcissus, Roman hyacinths, Dutch hyacinths and tulips. Narcissus was sold before the holidays and proved to be quite profitable. Romans came in during January and a good margin was made upon them, the returns being about twice the price of the bulbs. The Dutch hyacinths have been blossoming during the latter part of February and March. Easter is the season when these plants are in demand. The profits upon Dutch bulbs will not be large, growing them as we do, as potted plants, for the wholesale trade. Where a retail trade could be secured, or where the stock could be sold as cut flowers, the returns would be good.

Tulips did well, and seem to take the eye of the people.

We started a few cinerarias last August, and they have been in blossom during March. They are very popular and would sell well. One objection to them is that the price that can be secured hardly justifies the expense of raising them, as it requires a good deal of bench space to get well-shaped plants.

One of the greenhouses is now occupied with plants for spring setting and with beets for early market. Another is occupied with radishes, lettuce, hyacinths and potted plants. The third is devoted entirely to radishes.

One pipe-heated hotbed is devoted entirely to lettuce, one to beets, early cabbage plants, onions, and rhubarb, and a manure hotbed is filled with lettuce.

For early spring setting we have coming the following: Tomatoes, Beauty 4,500 plants; Dwarf champion 1,200 plants; lettuce, Black Seeded Simpson 1,400, Early Curled Simpson 1,400, Improved Hanson 1,400; Broccoli, 700; Cabbage, Early Summer and Jersey Wakefield, 3,800; Cauliflower, Snowball, 1,500; Celery, White Plume, 12,000-15,000.

We plowed a piece of early ground on the 15th of March. It is a sandy, well-drained piece, well protected and will be devoted to early vegetables and strawberries. We will set about one-half acre of strawberry plants of several varieties.

We contemplate setting several hundred fruit trees this spring. The trees will be set upon high ground, well drained. This ground has been under a heavy mulch of stable manure during the past month. The trees to be set upon it will be pear, plum and cherry. Some blackberries will be set upon part of this same area.

The excellent effects to be had from crimson clover as a cover crop was well illustrated in our garden this month. Last August we sowed crimson clover upon part of the early ground which was plowed upon the 15th of March. This crop did not get a very heavy growth, but the plants were strong and very well rooted. The difference in quality and condition between the clover soil and the adjacent strip which had

no clover was quite marked. The clover ground was much more mellow and worked better.

The orchards have all been gone over and carefully pruned during the past month. We feel almost repaid for the work by the improved appearance of the trees.

It was a hard winter on bees, some colonies in our apiary are entirely frozen out.

Some time ago we purchased a barrel kerosene sprayer, "The Peerless," from the Deming Company of Salem, Ohio. This firm very kindly donated a "Weed Kerosene Sprayer" to the department, and sent it on with the one we purchased. We are getting the machines in fighting trim for the war that is to be waged on bugs this spring. We expect to see some startling results with such pests as do not develop wings and fly away "as a bird."

During the past winter we tried raising rhubarb in the dark, *in total darkness*, and we are here to say that the dark grown product is as far ahead of the light grown product in every way as well treated celery is ahead of that which is only partially well treated. In color, quality and general appearance it is a great improvement over the old method.

JOHN F. CUNNINGHAM.

Asparagus Club Bulletin for March.

March 7—"Bacteria," R. J. Palmer; "The News," H. A. Clark.

March 14—"The Tomato," E. S. Livingston; "The News," F. K. Luke.

March 21—"Notes on Strawberries," Professor Lazenby; "The News," E. C. Cotton.

March 28—"Seed Testing," Harry Ballou; "The News," F. K. Luke.

Nature's Method of Distributing Plants.

Abstract From an Address by Professor William R. Lazenby.

The individuals of a given species of plant are usually distributed over a more or less extended area.

If we were to travel from the Atlantic coast westward to the Rocky mountains we would find the cottonwood, the dandelion, the yarrow, the common plantain and other well known plants more or less constant attendants upon our journey. Extending the range of our observations we learn that some of the plants named are not only thus widely distributed throughout the United States, but are found in other countries as well.

Species of water plants so often seen in our ponds, lakes and sluggish streams, are equally abundant in Europe, Australia, Japan and Eastern Asia.

Realizing these facts of plant distribution we naturally seek for some explanation, and find that there are only two rational methods of accounting for them. First, there must have been many separate and distinct creations of the same species in different places; or second, all the individuals of a given species must have descended from a single creation of that species, and in some way have become distributed over the areas where now found.

Inasmuch as there are no facts at hand to prove the theory of several centers of creation for the same plant, and since we know that nature has established various and efficient means for the distribution of species and varieties, it seems reasonable to believe that all the individuals of a given species have descended from a common ancestry, and that their distribution, however wide it may be, has resulted from

methods or agencies established by nature.

In considering these methods of nature, the subject naturally divides itself into two principal divisions: First, provisions for distribution made by and in the plant itself; and, second, certain forces of nature outside of the plant, which tend to make those provisions operative.

In the first division we find many interesting modifications of the structure of fruit and seed, as well as many equally interesting physiological provisions which have a direct bearing upon plant distribution. The principal forces outside of the plant, belonging to the second division, are winds, streams, ocean currents, birds and other animals.

The most marked and obvious modification of the fruit for the special object of distributing the species, are wings and pappus. The former are seen in the elms, maples, box-elder, ash, birch, ailanthus, hop-tree, horn-beam and other plants.

The latter which is an equally efficient aid to flight is seen in the thistle, dandelion, and many other species of the sunflower family.

Fleshy fruits, which appear to serve no special function in the economy of the individual plant, are effective agents in securing the disposal of seed. These fruits are eaten by birds, and the seeds are dropped oftentimes at great distances from the plant, which bore them. Thus, in a comparatively short time the descendants of a single plant may be scattered over a wide area. The common elderberry is often seen growing from the tops of decaying stumps, and raspberry plants are not unfrequently seen growing at a considerable height in the forked trunk of some large tree.

The mistletoe, which is found quite abundantly in southern Ohio and southward is almost wholly dependent upon birds for its dissemination.

It is said that there have been found growing on the ruins of the coliseum at Rome not less than 300 species, which, for the most part, were planted there by birds. Under the evergreens and in other places on the campus of our university the asparagus is very frequently found growing. The seeds having been carried by birds from the fruiting asparagus of the garden.

The nut fruits considered with reference to the habits of the squirrels, which so largely feed upon them, are well adapted for dispersal.

They are often carried a considerable distance from the tree that bore them, are deposited at various points, and hidden in various ways. They are frequently buried in the ground and not being reclaimed, are under the best possible conditions for germination and growth.

One of nature's most striking illustrations of adoption for distribution is seen the barbed arrows, beards and hooks that are found appended to the fruits of many different species. As examples, we need only mention the burdock, Spanish needles, tick trefoil, etc.

Attention may also be called to many curious and interesting mechanical contrivances for the dispersal of seed. The fruit pods of the witch-hazel and the seeds are thrown for some distance. The pods of the cranesbill and touch-me-not burst elastically and eject the seeds with some force. These and similar contrivances, while not very efficient compared with some of the modifications already mentioned, are adaptations to the same end.

Thus far we have spoken only of the modification of fruit; we should not forget, however, that the seed of many plants is also modified. Nearly all the species of the pine family have seeds that are winged. The trumpet creeper and catalpa are also

good illustrations. Many seeds are provided with a hairy outgrowth, called coma. The seeds of the cotton, milkweed, willow and poplar are familiar examples.

Other seeds are provided with a fleshy coat, called aril. The seeds of the wahoo or burning bush, the climbing bittersweet, and the nutmeg may be cited as illustrations. Some appear to have a special fondness for this fleshy covering of the seed coat, and the seeds of such species as have this structural provision are widely scattered.

Among the more important physiological provisions may be noted the marvelous fecundity of certain species, and the remarkable viability of certain seeds.

Everywhere nature exhibits immense fruitfulness. An averaged sized sugar maple on the university campus produced more than half a million seeds one fruitful season. A large purslane plant has been known to produce over one million seeds. A common thistle of average size was found by actual count to have 65,366 seeds. A single specimen of the shepherd's purse yielded 37,500 seeds.

This enormous productiveness is supplemented by a prolonged vitality. The seeds of the shepherd's purse, pigeon-grass, purslane and others have been known to retain their vitality for a score of years or more.

In some cases we have the curious provision of compact, rounded plants breaking off at the surface of the ground when mature and becoming "tumble weeds." Many plants are protected by a bitter taste or disagreeable odor, which enables them to thrive and multiply more surely than plants not so protected.

Is there any limitation of the distribution of plants? As a rule the plants of a given section are at war

with one another. Those which are most vigorous and have the fewest enemies will survive the longest. Climate is the most potent force in limiting distribution. Soil influences the continuity of range.

The distribution of plants as it exists at the present time is the resultant of many forces. The ocean currents, the glacial period and other geological changes, the agency of man, are among the factors that have ever been active in modifying the floras of different countries and ages. The final result is that the methods of distribution are so varied and efficient that every part of the earth's surface, wherever plants can exist, is likely to be supplied with that form of vegetable life that is most appropriate.

Locating and Building Creameries, Cheese Factories and Farm Dairies.

The demands of butter and cheese-making have become so varied and the needs of the dairyman have become so abundant, that the time has arrived for those who are in this business to look for newer methods and more convenient arrangements that they may produce their product more economically. It is necessary for them to take advantage of all natural means possible to locate judiciously and properly manage their affairs on business principles. With this view I will aim to point out the requisites to my mind necessary to erect and profitably put in operation a creamery, cheese factory or farm dairy.

Taking up the question of creameries first, How and where should we build such a modern separator plant? The best place for the successful introduction of the creamery is a farming district, where dairying has been long practiced and where butter is the lead-

ing product, but yet not of the highest reputation as to quality. Such conditions insure the number and kind of cows needed, with the proper care of the animal, and the proper knowledge of the detail involved. There are many creamery buildings through the country which are standing idle simply because the conditions necessary to success were not recognized in advance. The plants have been located in communities where farmers had no knowledge whatever of dairying, were unfamiliar with cows and their care, and, if accustomed to cattle at all, they generally had the kind not suited for the production of milk. The first requirement then is a sufficient number of cows. The more milk the more profit. A thousand-cow creamery is more profitable because it can be more economically conducted.

The total cost of running a creamery and marketing the product, including interest on investment and provision for a sinking fund, should never exceed $3\frac{1}{2}$ cents for every pound of butter made. Under favorable conditions this cost can be reduced to 3 cents, and even as low as 2 cents. This is only practicable where patrons deliver their own milk at the factory. As a small creamery can not be operated for less than \$4 to \$5 per day, it becomes evident that the daily product should be over 150 pounds of butter as a safe minimum. Consequently, no creamery should be put in operation unless having the control of the milk from 300 cows. The greater the number of contributing cows and the better the quality of cows as butter producers, also other things equal, the more certain the success of a creamery. On the other hand 1,500 cows is considered a maximum number, as the factor of transportation of milk comes in

here as an expense to destroy the increasing profit.

Next a creamery must be located as near as possible in the center of the milk producing community, and having the milk routes not extending over seven miles from the creamery. This, however, depends more or less on the condition of the roads in that community.

Select a location where provision can be made for good drainage. This is of utmost importance, yet in many cases evidently the last thing thought of. It should be near some live stream, where the outlet of the drain can be placed under water, or the drain should be conducted not less than 50 rods from the building. The longer the drain, the better. The drain should consist of glazed tile not less than 5 inches in diameter, conducted at least 15 rods from the factory. From there on common tile may be used, if satisfactory to the community through which it runs.

A reliable supply of good water is again of great importance. The water must be pure and guarded against future contamination. Cold water will be a great saving of ice. Surroundings should provide pure air, and freedom from dust and exposure to direct sunlight. A lawn with some low shrubs will greatly aid by purifying the air, beside making the surroundings more attractive. Also a location with reference to point of shipment for products and market to which the product goes, deserves some attention.

The dimensions of the creamery building depend on the amount of butter to be manufactured and somewhat on the arrangement. It, however, should not be too small, nor too large, for it takes that much more labor to clean up an extra amount of waste floor space. Another advantage in having the plant in a

compact form is that it teaches the operator to put utensils back in a place after using them, as it is necessary for him to have the required room. A creamery handling the milk from 300 to 500 cows should contain about 1,200 to 1,500 square feet of floor space, not including a cool room.

In planning or building a creamery one should try to so separate, and yet combine, the different sections as to secure both convenience and cleanliness, and to reduce as far as possible the expenses necessary to perform in the best manner the labor of the factory. All who have had experience with creameries (and this is equally true with cheese factories) know well the loss of time and waste of labor attendant upon our seemingly small mistake in construction, such as putting a door in the wrong place, or other little faults in the arrangements of the utensil rooms. One should endeavor too see such faults in advance, so as to save the operator as much work as possible, and enable him to reach given points easily and readily, without taking unnecessary steps by a round about course.

There are two general principles which govern the arrangement of creamery building. One is where milk starts on such an elevation that it flows by gravity from the receiving vat into the tempering vat, separator, cream and skim milk vats. This again has two principles involved in it; one where the milk is taken in on an elevation, such as a side-hill or two-story plant; the other where the Jepson elevating weigh can is used. The main advantage of the former is that no pumps, which are so troublesome to clean, are necessary during the whole course of manufacture. But this advantage is off-set by a considerable amount of extra labor in ascending

and descending the necessary stairs, during just the time when work is crowding and nearly all the machines are in operation. It is at this time in a small creamery when the man at the weigh can should reach the boiler, engine, separator and test bottles in the shortest time possible. Convenience is an essential point to be taken into account in creameries.

The advantages of the latter system, the Jepson elevating weigh can, is that it does away with the platforms and stairways, puts all machines on the same level, and takes up less room than the former system. However, on the other hand, the greatest objection is the liability for mistakes in weighing the milk on account of the friction produced by the quick rollers on the weigh can. It is also quite complicated and needs considerable care in handling it.

The second of the two principles is the pumping system. This is more economical of labor and saves room, but introduces pumps through which the milk must be passed and which are always more or less difficult to keep clean and exceedingly liable to be neglected. Therefore, if a pump is to be used, it should always be of the simplest kind; one that can readily be taken apart. Mr. Gurler states in his *American Dairying*: "I prefer a creamery built all, except the receiving room, on the same level, and pumps used to elevate the milk and cream. The receiving room should be enough higher than the main floor so that the milk will run from the weigh can into the receiving vat, and pump it into the tempering vat."

I wish to criticize Mr. Gurler's arrangements. It seems to me unnecessary to use two pumps in his arrangement. One pump is bad enough to pass milk through, not to say passing cream through another one.

His operator has to walk up one flight of stairs to reach the weigh can.

Then why not, by increasing the size of the platform, have the separators on the same level as the weigh can, and the receiving vat on the same level as the churn and worker. It is nearly as easy in this case to pump milk 8 feet as it is to pump milk 4 feet. Consequently, he can take in his milk at the same level as before and run it into the receiving vat on the first level. Then it can be pumped into the tempering vat and separator on the second level, and from there on letting the cream flow over the cooler into the cream vat; also into the churn by gravity; at the same time using but one pump and only having but one to clean; also having his separator situated to a better advantage than in the former case. It now remains for you to decide which system you prefer. It will be found of advantage in controlling the temperatures, and in convenience to clean, to introduce partitions separating the churn room from the separator room, and also those from the cream room.

Construction of Building—The building should be laid on solid foundation walls, rather than upon piers. This, besides keeping the building warm in winter and cool in summer, adds decidedly to the appearance. The foundation should not be less than 1 foot in depth and 18 inches in width. This must be grouted well with crushed stone and cement. Upon this foundation a wall can be built not less than 24 inches high. As to the width, it depends on the material used. If common wall stones are used, about 15 to 18 inches would be the proper width; if range stone, 8 inches, and if glazed hollow brick are used, 12 inches would be ample in width. Sills may be of hemlock, 6x6, or it

may be a box sill made of 2x8 Norway pine. In case a wooden floor is wanted cross sills are necessary to support the joist. These cross sills should in turn be supported by 18 inch square buttments, not more than 6 feet apart. Studding may be of hemlock and need never be more than 2x4 inches in size, and 12 or 18 feet long, according to the desired height of the building. Studding 14 feet high make a more attractive building, and at the same time give more room for building the ice box higher in the refrigerator, increasing its capacity.

It is essential for every creamery to have a first class floor, be it cement or wood. If a cement floor is preferable it should be put down in the very best shape. A cheap cement floor is next to no floor in a creamery. A cement floor should be made as follows: First fill in with small cobble or broken stone, then put on dry sand mixed with a little common cement, and pour on water and wash the mixture down among the stone, so as to firmly imbed them. Then puddle on a mixture of common cement and sand, half and half, and apply it 2 inches thick; on top of this spread a thick coat from 2 to 2½ inches of Portland cement and fine sand, mixed half and half. Let this harden thoroughly and a good floor can be insured if the Portland cement is of the best kind. This makes a rather expensive floor, but one can not afford to put a cheaper floor in a creamery in the line of cement. A wood floor in general gives better satisfaction than a cement floor, for the simple reason that a cement floor is hardly ever put down right. In putting down a wood floor, one should first see that the joist are of Norway pine or good white oak, not less than 2x8 inches in size, laid full straight on sills 16 inches from centers. The length of

the joist should not exceed 12 feet without having a support. The flooring may be of good white oak or No. 1 Georgia pine. If the very best white oak can not be obtained, I would prefer Georgia pine. The flooring should be from $1\frac{1}{2}$ to 2 inches in thickness, and secretly spiked to each joist dressed and matched. The tongue and groove should be painted with white lead, and when completed should be covered with a coat of boiled linseed oil applied hot and thoroughly brushed in. The refrigerator floor should be made the same, except that the space underneath should be filled with cinders to the joist, leaving a dead air space between the cinders and flooring. The boiler room floor may be made of cement or of hard brick laid in cement.

The studding should be set 16 inches apart from center; toe nailed to sill below, and also firmly nailed to roof plate, which is of the same material.

Rafters can also be of same material as studding, but not less than 2x5 inches in size for a shingle, steel or galvanized roof, and 2x6 if slate is used for roofing. A shingle roof seems to give the best service for a creamery. it keeps the building cool in summer and warmer in winter. As far as durability or being fire proof is concerned, a slate roof is far superior. However, a good shingle roof will outlast a creamery. It is seldom the case that a building catches fire by sparks directly lighting on the roof, but the cause is more likely to be due to defect below the roof, so a shingle roof is nearly as safe as a slate roof.

Siding—It may be 5 inches, popular lap or pine drop siding, the latter being the cheapest.

The building should be ceiled entirely on the inside, except the boiler room, which should be lined with

corrugated iron or made of brick. The ceiling should be the best yellow pine, $\frac{5}{8}$ to $\frac{1}{2}$ of an inch in thickness. Two dead air spaces can be cheaply constructed on the entire building by putting building paper up and down on the studding, nailing over this $\frac{1}{2}$ x2 inch strips, and ceil on strip. Paper must be secured at top and bottom, so that a perfect dead air space is the result. Lath and plaster may be used as a substitute for paper, but with more expense.

The Drain—If a cement floor is used the floor should slant $\frac{1}{4}$ inch to every foot from all directions toward one point, the inlet to the underground drain, at which point a common S trap should be connected to prevent the odors from the sewer from coming up into the factory, or the floor may slant toward a cement gutter, which should lead to this inlet.

If a creamery is to be built with wood floors it is always best to use a gutter set into the floor for the drain. This can be constructed by placing two joists about 4 inches apart and letting them extend the full length or width of the building, as per design. Cut the floor flush with the edge of each joint. Rabbit these ends $\frac{1}{2}$ inch on each side, and paint with white lead, then lay in a coating of putty and form the gutter of of galvanized iron or preferably copper, so that it will set down in between the joist, and turn over where the floor is rabbited; nail onto the floor, driving the nails close together; then give it another coat of white lead and putty again. The slant of a wood floor should be the same as that of a cement floor, and the gutter itself should also have the same slant toward the trap. A cast-iron gutter may be used in place of the galvanized iron, or probably best of all for a wood floor is a gutter worked out of a solid piece of wood,

well oiled before it is put in place. The sides and ceiling of the interior building should have at least one coat of shellac; two is better. This makes a sort of enamel finish and can be easily washed.

It goes without saying that the outside ought to be painted to make the building neat and attractive.

(To be continued.)

President's Address.

Delivered Before the Annual Meeting of the Ohio State Dairy-men's Association, by
J. Fremont Hickman.

Gentlemen—We are assembled today in our fifth annual session. Four years ago ex-Governor Hoard, from the great dairy state of Wisconsin, came to our annual farmers' institute held in this, our Capital City. Governor Hoard at that meeting discussed the dairy cow, dwelling especially upon the nervous temperament, and if I may be allowed to draw my own conclusions without let or hindrance, I will say that in my judgment the ideas advanced took root upon the less nervous temperament of some of our best dairymen. The result of his address culminated in a call for a meeting at once to form the nucleus of what we now call the Ohio State Dairy Association. The number enrolled as members at that time did not exceed a baker's dozen, but I believe they were made of Ohio material. * * *

Gentlemen of this association and dairymen of the State of Ohio, I do not care to make comparison as to the relative value of Ohio's dairy products when placed alongside of those of New York, Indiana, Iowa, Illinois, Wisconsin and other eastern as well as other western states. It is enough to know that these

states have strong dairy associations, and that the states mentioned and some others are making rapid strides in building up and educating the people to a higher degree of efficiency in dairy lines. I ask the question this morning if Ohio, with more than half a million cows, can afford to take a back seat in one of the greatest industries of our state. Ohio, with her numerous cities, furnishing consumption for nearly, if not quite, fifty million gallons of milk; Ohio, producing as she does fifty to sixty million pounds of butter annually and nearly fourteen millions pounds of cheese, should support one of the best dairy associations on the American continent. With these products alone the great dairy interests of our state should be returning, at the lowest calculation, \$10,000,000 for milk, \$6,000,000 for butter and \$1,000,000 for cheese, or a total of about \$17,000,000 for our dairy products, leaving out of consideration the increase in Ohio herds. With the supposition that the above figures are correct, the average from each cow in the state (590,000) is a little less than \$30 per head. The average dairyman can not feed a cow and have her do her best much under the \$30 per year. There is, therefore, room for suspecting that some of us are feeding cows without any profit. Now, which of us is it that is keeping cows at a loss? I almost think I can pick him out as I look out of a car window and see a cow with her back bowed up trying to warm the barnyard. That is surely one place where dairying is not paying. Then I happen to know a fellow who gets up before daylight winter and summer, works hard all day and far into the night, and his wife and children are slaves to the business of running a dairy. This same fellow is wasting tons of feed annually on account of

poor feed troughs and open stalls. He is taking in lots of money, but he is doing all by main strength, and does not attempt to do any part of it by thinking or calculating; surely this is another place where dairying does not pay.

Only a few days ago a dairyman came into my office and during his stay said that he was feeding one cow eight quarts of bran and eight quarts of oats and corn each day, and that she was giving but four quarts of milk per day; and this is another kind of dairying that does not pay. I am here to say that no one may know all about dairying, and doubtless any of the three above mentioned could teach me some things I do not know on the subject. These facts make associations of this kind a necessity. We come here to compare notes, to advise with one another, to consult upon subjects that none of us perhaps fully understand; we come, in short, to acknowledge our ignorance, to be benefited by our mistakes, as well as others. We gather in these conventions that we may be mutually helpful to one another.

Some one has said that a sound discretion is not so much indicated by never making a mistake as by never repeating one. I venture the assertion that one-third of all the cows within Ohio are not paying their board; that nearly, if not quite, one-half of the other two-thirds do not more than pay for their keeping and make good the loss of the first third. We figure from this that two-thirds of all our cows return no profit whatever, and that only one-third (that is, the remaining third) can be classed as genuine profit makers. This division into thirds may not be just mathematically exact, but it at least illustrates in no exaggerated form the situation as it exists and confronts us today. The

cow that does not produce 4,000 pounds of milk in a year is not a profit maker, unless that milk analyzes 4 per cent. butter fat, and then only in case of receiving an average price of 20 cents per pound for the butter made.

I presume there is not a man in this room, nor a dairyman in Ohio, that does not have some well defined ideas about pruning his fruit trees, berry bushes, and possibly every one occasionally cuts down or grubs out trees and bushes because of their worthlessness. If this be true of the tree and shrub that produce fruit, is it not equally as necessary to weed out the dairy? I wish every man in Ohio who calls himself a dairyman, and indeed every man who is the owner of a cow, could be brought to realize that it costs money to keep a cow, or money's equivalent in grain, hay, pasture and labor. How frequently we hear the farmer say, "Oh, well, I have the corn, oats and hay, and I may as well feed them out!" This is all very well, if they feed as they sell, only to such animals as would pay for their keep, and leave a margin with which to add more comforts and greater conveniences to their home. I speak with candor and with a conscientious regard for the truth when I say that I believe that with the scales and the Babcock tester as our guide, it is quite as possible to have a herd of cows that will average 250 pounds of butter, or 600 pounds of cheese, as it is to have one that will average much less than that. I believe every cow that does not make for her owner \$40 each year should be sent to the shambles without delay. This, I say, should be the minimum, and when that point is reached it will be the first step in the right direction, and don't let us forget that it is the first step that counts, and it does not make any difference

which way you are going, backward or forward, the second step will always be easier than the first. Once on the right road, remember, it will neither be hilly nor crooked, obscure nor difficult to find. The man who builds your barn and equips it must not only have skill and the proper tools to work with, but must also be provided with suitable material and assistance. Apply the same principles to your dairies. Secure the animal that produces milk, both quality and quantity, give her material of a suitable kind, with a comfortable stable and suitable environments, then study conditions, and you have solved your first problem in multiplication. If there is any man in this state keeping cows who is not making money, I say in all kindness that the trouble must be at home. No man or no law compels any one to keep poor cows. It is a voluntary act. I firmly believe that the cow power in this state could be increased at least calculation, 50 per cent without increasing the number of cows or adding anything to the expense side of feeding and caring for them.

For a series of years your president has watched, with no small degree of interest, the development relating to the health of our dairy herds, and its possible effects upon the health in our homes. Massachusetts New York and other eastern states have spent thousands of dollars in attempting to stamp out that dread disease, tuberculosis, from among their dairy herds. This disease is not confined to the more eastern states, but is found in most every section of Ohio. In my judgment the time is not far distant when the people of this state will be compelled to meet the question how to get rid of the trouble or how shall we prevent its general dissemination. I can not see but that it will be met

by legislation in some form. For my part I could not favor the drastic measures enforced in New York, Massachusetts and New Hampshire. I believe some compromise measure should be adopted. I believe the association should be early on the ground and formulate plans for putting milk upon our markets that will, at least, be comparatively free from these disease germs. Let the dairymen of this state lead in this idea and not be driven into it by the consumer of our dairy products. Our state legislature at its last meeting gave to our experiment station, one thousand dollars to make some investigations upon the subject. To have made that work anything like exhaustive, five thousand would have been none too much. With the one thousand we will be able to demonstrate some points that will be useful to our dairymen. Our State Dairy association, at one time, ventured to ask state aid that we might become more useful to the people of the state in suggesting legislation, and advancing dairy interests generally. In this we have failed thus far. We were not making a precedent in this matter, for we find that New York, Vermont, Indiana, Iowa, Wisconsin, Nebraska and possibly other states have been giving their State Dairy associations financial aid. The time has long since passed when Ohio should have been classed among those receiving help from its state treasury. I therefore recommend that before the association closes this annual meeting that a committee on legislation be appointed, with instructions to look after our interest as an association and as dairymen. This committee should be given a wide range that they may not only look after the things herein suggested, but should be prepared to oppose any and all matters of legislation which are adverse to our in-

terests and to the general welfare of the greatest number.

Before our session closes we will have before us a proposition to divide our association into sections, representing different divisions or parts of the dairy industry. This should be given early attention that it may be acted upon with forethought and intelligence.

During the year past some strange things have happened which must sooner or later affect the dairy interests for better or for worse. I refer to our recent unpleasant election of dairy and food commissioner. There seems to have been two sides to the case, as there always is when matters are in a chaotic condition. I have not been able to fathom all things, and like hundreds, yes thousands of others, I am not prepared to say which side I am on. I confess the situation is at best an unpleasant one, and I add further that I sincerely hope that we shall all know more upon this subject before, I was about to say, thirty days, but I guess I will try to be satisfied if I learn after the present commissioner's term expires. Let me add right here that the dairymen of Ohio should have been so thoroughly organized last fall that they could have made their influence felt in discovering where that nigger was lurking in the woodpile. May this be to us a lesson for the future; one never to be forgotten. Time may reveal to us the light we seek, but we should not suffer such procrastination.

Gentlemen, there are other subjects of general interest to us all that I would be only too glad to dwell upon, but I am aware that this address is already too long. Let me say in closing that the success of this convention will depend upon the spirit in which we all come to it, and quicken it with our questions and with our answers. Let every man that is here now or may come in

later be informed of the fact that this is his meeting. We want rapid questions, full and free discussion on the part of those present, whether old or young. We all know that in our dairy business we are constantly struggling with what I may appropriately term our own ignorance. There is not a man here but can give some suggestions of value to others of us. One of our great difficulties everywhere is that we shut ourselves up; we don't open our minds, our hearts, our eyes, and take in the experiences of our fellowmen. We come here to go to school, as we did in the little red school house years ago. When we run against a snag and find that we can not extricate ourselves, let us call upon the experts who are located in this building to lead us out of the wilderness into the broader light of useful information, and when our meeting here has drawn to a close may we all feel that it has been good for us to be here; may our association feel that it has grown stronger and passably able by another year to hold its sessions in some other part of the state if it should be thought best. May we all go away feeling that we have gathered some light by meeting here in connection with Ohio's great dairy school, and may the Ohio State University ever grow greater and stronger until her influence may be felt in every city, in every hamlet, in every township, yes, in every school district within our great state.

The horticulturalist is a dealer in watered goods. All his fruits are mostly water, and if he controls the pipe line well, and produces a good article, people will pay the price.

"It iz better to keep 5 cows an' mak \$50 a yere, than to keep 50 cows an' mak \$5 a yere. This iz a well known factt."

Veterinary Items.

SUSPECTED GLANDERS.

Just about a year ago this time a horse was brought to our clinic with the statement of the owner that the animal had been condemned by a veterinarian as being glandered. The animal was a large bay gelding, weighing, in good order, about 1,600 pounds, nine years old, rather poor in flesh. The horse had been working in a stone wagon for about two years for the present owner, and as he was an excellent animal the owner was anxious to have the most careful examination made before destroying him. On a clinical examination the case seemed very suspicious, many of the symptoms of a chronic case of glanders being present. There was a unilateral nasal discharge, not very offensive in character, the mucous membranes of the nostrils was somewhat thickened. The coat of the animal was dull and staring, as in glanders, and the horse was dull and stupid. As glanders is the most fatal and dreaded of all equine diseases and is absolutely incurable, a most careful method of diagnosis was determined upon, both for the benefit of science and the owner. Some of the typical symptoms were wanting on clinical examination, but this is often true of every disease, and should be carefully noted in every diagnosis. The horse was kept isolated from all other patients while undergoing examination. The first test made was to inject hypdermically 2 cc of mallein under the skin in the region of the croup. If the animal is affected with glanders, or as it is termed technically, morbus mallei, within 24 hours he will show a high fever, attended with considerable swelling in the region of the injection wound. These symptoms will abate within a few hours. In this case, however, the results were negative. To make

the diagnosis positive the inoculation of guinea pigs was next determined upon, and two were secured for the purpose and the experiment carried out in the following manner: A sterilized absorbent cotton swab was saturated with the nasal discharge and then soaked in distilled water. This extracts the bacilli or germs of the disease. Several centimeters of this extract were then injected into the peritoneal cavity of both guinea pigs. A few mornings later one of them was found dead, and a postmortem revealed that a bowel had been punctured in making the inoculation. This had set up a peritonitis, which had caused the death of the little animal. After waiting the usual period of incubation the other guinea pig showed no symptoms characteristic of the disease. This was pretty conclusive evidence that the horse was not affected with glanders. It seemed probable that the nasal discharge came from one of the superior maxillary sinuses, and it was decided to trephine the sinuses of the affected side to determine the cause, if possible. The horse was cast and secured, chloroform administered until anaesthesia was produced. The sinus was then trephined over the root of the fourth molar. This revealed the root of this tooth grown to enormous size, a long prong reaching through the sinus nearly to the eye. The extraction of teeth in a growing young horse is always very difficult, and in this case it was necessary to remove the third molar before the other could be extracted. Within a few days of the operation all the mysterious symptoms had disappeared, and under careful treatment the wound healed nicely and the horse was turned over to the owner sound and healthy, well able to perform years of hard work. This case illustrates how careful the veterinarian should be in making a

diagnosis. Had the first advice given been followed, a valuable horse would have been destroyed, entailing a considerable financial loss to the owner. The case was exceedingly interesting from a scientific standpoint, but was much more valuable from the lesson it taught.

RANDOM NOTES.

We are often prone to laugh at the mistakes of laymen, but when we reflect on how many cases we are in the dark ourselves it often seems as if our ridicule was unjust. Hardly an anatomy horse is used here that does not show an aneurism, or partial plugging of the anterior mesenteric artery on post-mortem examination. Nearly every horse has a large number of the larvae of the bot fly attached to the mucus membrane of stomach and small intestines. This is often supposed by laymen in making post-mortems to be the cause of death, especially if the animal showed colic symptoms before death, while the real cause, whatever it may be, is overlooked or its significance not understood. As a matter of fact, these "bots" rarely if ever cause death, or even colic. The layman rarely notes but one symptom, and that is always the way the animal behaves himself. No attention is ever paid to essential things like the pulse, respiration, temperature, but if a horse assumes a sitting posture it is regarded a symptom of rupture of the diaphragm. The older school of veterinarians paid more attention to such symptoms than is now the case, and many of the old "every man his own horse doctor" books are largely responsible for this. A few weeks ago a large white horse was brought in very lame apparently from ringbone on the coronet of the right hind foot.

The owner requested that it be fired, the animal had become very much lamer during the last few days. The ringbone was fired as requested by the owner. The toe of the foot needed shortening, and when the foot was picked up and cleaned a nail was discovered sticking straight into the sole. It was promptly extracted and the wound treated, and the horse was led off scarcely limping at all. On March 16 a horse was presented at clinic, owner saying that his breath was bad, and at times he refused to eat. He said at one time he suffered from a fistulous opening of one maxillary sinus. At that time he was treated by a quack, who pronounced it a well developed case of "head rot." No benefit resulting from treatment then prescribed he brought the horse to us as a last resort. An examination of the mouth revealed a supernumerary molar attached to inner side of second superior molar of the left side. All the treatment necessary was extraction, which was done at once, and the tooth was found to be badly decayed, which of course had given rise to the offensive odor.

We treated a horse for a young man from Park's Mills during the winter. The animal was suffering from a poll evil, which did not appear at all serious at first. There were three openings at the poll in which it was difficult to introduce a probe. There was but little discharge, but the case did not improve under treatment. It was decided to operate and determine the extent of the diseased tissue. The animal being cast, an incision about 4 inches long were made on the right side of the poll commencing an inch or so back of the ear. From the opening an enormous amount of old caseous pus flowed. As the probe would not reach the bottom of the "pocket," a probing was introduced and reached almost to the point of the shoulder.

The owner seeing the extent of the diseased process requested us to chloroform the animal and kill her, which was done. This pocket was almost large enough to admit a man's arm and was filled with old pus. We did not even suspect the extent of this opening before, and the case could have been treated for months without getting any results, and even after finding the extent of the injury it would have been almost impossible to have effected a cure, and the owner took a very sensible course in having the animal destroyed.

Financial.

The New York speculative stock market exhibits irregular strength in the face of higher rates for call money, though the completion of the April disbursements is expected to bring renewed ease.

Despite the erratic fluctuations of the industrial securities on the Stock Exchange during the past few days, there is no question that a more confident feeling underlies the speculative and investment situation. The opening of spring is usually followed by a revival in speculative values, and even at this early period there are evidences that the tendency is to discount coming crop prospects. Of course there are no direct indications yet as to the extent of the coming grain crops, but Wall street seems to have taken it for granted that if stories of excellent crop prospects are not supported by facts, neither are rumors of damages worthy of credence. The result has been an acceptance of the theory that the cereal production will be up to the average standard, and thus furnish continued heavy transportation to the railroads, and active business in all lines of industry. The standard shares have re-

flected this in their quickness to respond to all favorable stories. The passing of the tight money scare has also been responsible for a revival of confidence. The demonstrations of strength given by the banks, not only in New York but all over the country as well, have been too plain to escape attention. Call money on the Exchange, it is true, has shown some extreme fluctuations, going as high as 9 per cent, but special causes attributable to the financing of one of the new industrial combinations were behind this.

Demands for funds from the interior, combined with some large payments in connection with the formation of industrial combinations, has reduced the supply of money available for call loans in the New York market during the month. The banks generally marked up their standing arrangements, and call money at the Stock Exchange has been quoted at 5@6 per cent, while transactions were made at 8@10 per cent, the highest rates for some time past. Later the completion of the syndicate operations above referred to released considerable sums, while the higher level of rates presumably checked the movement of money to the interior, if it did not attract additional supplies. The call loan rate has been, however, maintained, although at the Stock Exchange bankers' balances loaned at lower rates, and the majority of transactions have been at 4@4½ per cent. The fears of stringency or tight money which were heard some time ago have quieted down, with a general expectation that renewed ease will be seen after the April 1 disbursements are completed and large sums begin to find their way back to the financial centers. Much of the current discussion concerns the attitude of lenders toward industrial securities. In some cases such stocks are rejected altogether, but other in-

stitutions lend on them at an advance over current interest rates or with exceptionally large margins. There has been a good inquiry for time money, and increased freedom is seen in the offerings at $4@4\frac{1}{2}$ per cent.

Reports of earnings of all the financial institutions in the country continue gratifying, although in some cases, as the railroads, not up to previous months. Allowance must be made for the season of year and hindrance by storm to the free passage of traffic. Industrials are in good favor on account of advancing prices in nearly all lines of manufactures. There has been no greatly appreciable decrease in the bank clearings of the country, and business conditions promise greater things than have yet been experienced during the present tide of prosperity. Crop reports are very conflicting and often misleading, but there is not likely to be any great shortage in any crop.

Stormy weather, retarding spring distribution in some sections, has imparted an irregular appearance to general trade, while some few reductions in prices of leading staples, notably raw cotton and wool, copper and some few other metals, serve to break the otherwise almost unvarying appearance of strength of staple values. The general commercial situation, however, continues to present much apparent strength and the few lines that note a quieter tone of business find ready substitutes among other branches, which as yet have been rather backward. The see-saw of grain prices has been downward this month, largely owing to speculative overselling during the recent depression, which, by the way, again developed some good foreign buying. Better weather at the south and especially improved roads find reflection in a larger vol-

ume of receipts of cotton, and the result is a fractional shading of prices. C. L. S., *Railroad Ed., Col. Dispatch.*

Books and Periodicals.

The class in stock feeding in the College of Agriculture has selected "Feeds and Feeding," by W. A. Henry, for the text book for next term. This in itself is a guarantee of the value and worth of the work. We wish to take this opportunity of recommending this book to all students and agriculturists. It is a work worthy the respect of everyone who has anything to do with live stock, and its price is small compared with the value it is to one who possesses it. The price of the book is \$2, but we will furnish the book and the Agricultural Student Magazine for one year for two dollars (\$2.00). Don't let this chance pass.

PRINCIPLES OF AGRICULTURE for common schools; I. O. Winslow, A. M.; pp. 152; illustrated; cloth; American Book Company, Cincinnati. This book is intended as a text for the pupils of the common schools. It is arranged in an orderly manner, and at the end of each chapter a list of questions upon the contents of the chapter as presented. In the author's preface he says "the book is designed primarily for use in the public schools, and contains no difficulties too great for ordinary pupils of twelve or fourteen years."

In his statements the author is clear and exact; the language is accurate and simple. The manner in which the subjects are treated may be seen from some of the questions which appear at the end of the chapters. We will take a few at random: What are Plants? What are the Two Essential Parts of a Seed? What is the Embryo? How long Will Seeds Preserve Their Vitality? etc. The first few chapters of the

book contain little that pertains strictly to agriculture, but they present information upon the sciences that make the basis of agriculture. The last four chapters of the book are upon Plants, Fertilizers, Cultivation and Animals, and are quite practical. A very good book for elementary instruction in agriculture.

PRINCIPLES OF AGRICULTURE:—L. H. Bailey; pp. 300; illustrated; cloth; The Macmillan Company, New York; \$1.25.

The name "Bailey" upon the cover of a book relating to horticulture or agriculture means that what the books contains is the result of the latest advances by the most progressive men. This book is not an exception to the rule. It is not so much a book composed by Professor Bailey as it is a book edited by him. As in every case this gentleman has the best of writers to prepare the different departments of the book under his direction.

Basing his operations upon the assertion that "agriculture is pursued primarily for the purpose of gaining a livelihood, not for the extension of knowledge; * * therefore a business, not a science," he has gathered together a very able corps of correspondents, who have treated their various subjects in this order: "The Texture of the Soil," John W. Spencer; "The Moisture in the Soil," L. A. Clinton; "Enriching the Soil; Commercial Resources," G. W. Cavanaugh; "How the Plant Lives," B. M. Duggar; "Preparation of Land for the Seed," I. P. Roberts; "Pastures, Meadows and Forage," I. P. Roberts; "The Management of Stock," I. P. Roberts; "How the Animal Lives," James Law; "The Feeding of the Animal," H. H. Wing.

Besides these chapters, Professor Bailey furnishes several chapters from his own pen. The book is well

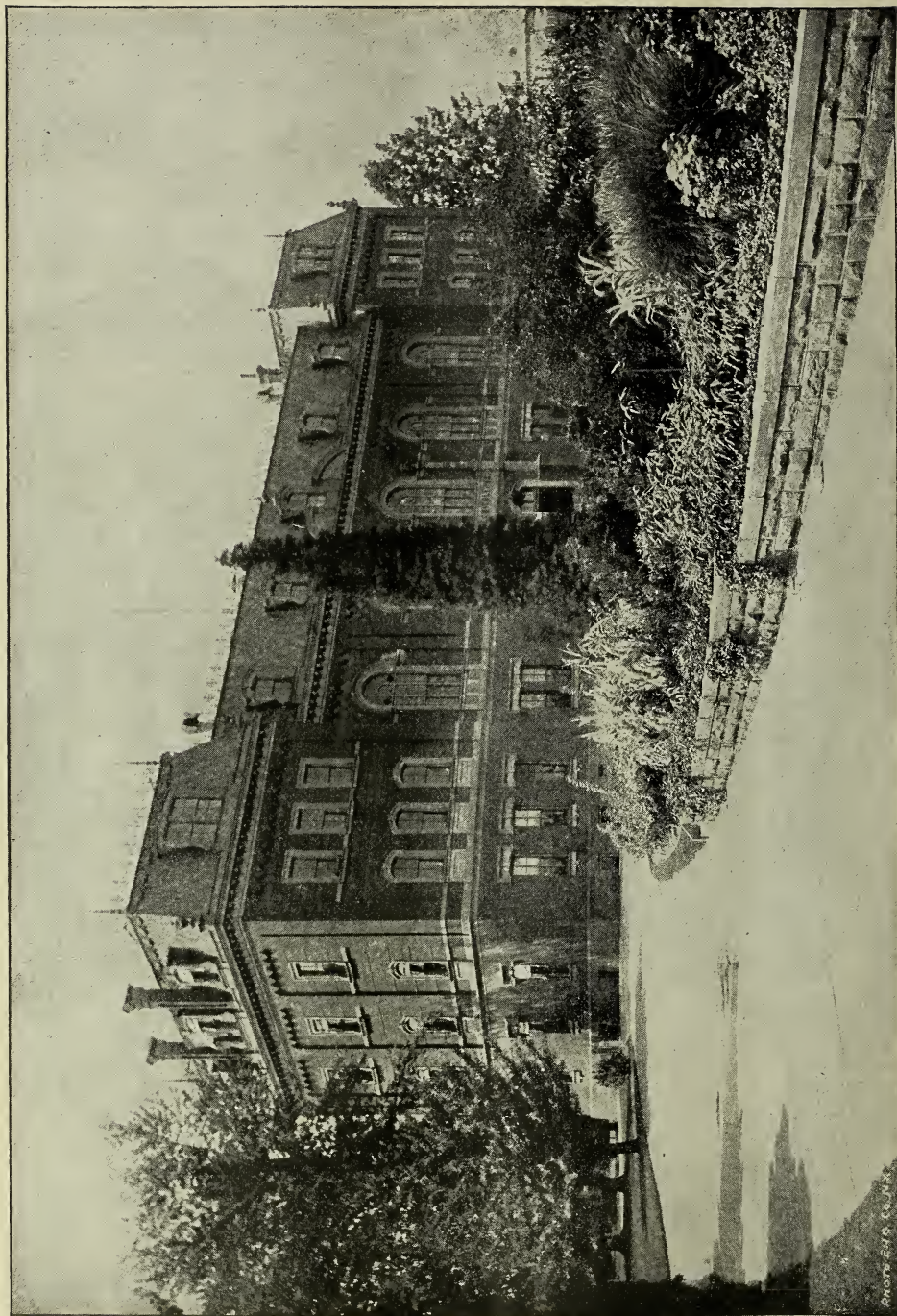
indexed and has quite a complete glossary.

Perhaps we could not convey a better impression of the intent of the author than to quote a few words from the latter part of the preface: "Agriculture, then, stands upon business, but science is the staff. Business can not be taught in a book like this; but some of the laws of science, as applied to farm management, can be taught, and it is convenient to speak of these laws as the principles of agriculture."

The book is well illustrated with original and attractive pictures, which are not only fascinating, but are at the same time instructive. This book is a store house of practical and sensible suggestions, and should be owned by all farmers and teachers.

AGRICULTURAL EDUCATION comes to us regularly from New Hampshire college, Durham, N. H. It is a very neat 16-page periodical, in magazine form, and its matter is exceptionally fine. The papers and items which it publishes are clear, plain and practical, coming from persons with large experiences in practice and with unusual capability in the sciences. Prof. Charles W. Burkett, the editor, deserves especial credit for the general appearance and make-up of this admirable paper. We trust that we shall be favored with exchanges in the future.

A new horticultural publication comes to us in the form of a 12-page monthly called the **MIAMI VALLEY HORTICULTURIST**. It is published at Dayton, O., by the Horticultural Publishing Company. It is very nicely arranged and neat in every way. It is devoted to the "Development of practical and decorative horticulture, beautiful homes, artistic lawns, party decoration, birds, good roads." Success to it.



MAIN BUILDING UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

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